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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,999	11/21/2003	Knut Kahlisch	1890-0011	1506

7590 04/06/2006

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EXAMINER

RAO, SHRINIVAS H

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/719,999

Applicant(s)

KAHLISCH ET AL.

Examiner

Steven H. Rao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1,3-11,13,14 and 23-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1,3-11,13,14 and 23-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Response to Amendment

Applicants' amendment filed on January 20, 2006 has been entered and forwarded to the examiner on January 30, 2006.

Therefore claims 1 and 23 as amended by the amendment and claims 2-11, 13, 14 and 23-31 are pending in the Application.

Claims 12 and 15-22 were previously cancelled.

Information Disclosure Statement

No further IDSs have been filed after the resubmission of the previously filed IDS on May 04, 2005.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsai et al. (U.S. Patent Application publication No. 2002/0092162 now USP No. 6,772,512, herein after Tsai) or Kovac (U.S. Patent No. 4,888,885, herein after Kovac) both previously applied and further in view of Lynch et al. (U. S. Patent No. 5,763,952 herein after Lynch).

With respect to claim 1, to the extent understood, Tsai or Kovac describe a package supporting structure for a chip, comprising: a supporting substrate with a bond opening therein (Tsai figure 2A # 210 substrate, opening # p, or Kovac figures 2-3 #10 with opening 16, col. 3 lines 60-67) ; an interconnect layer on the supporting substrate Tsai figure 2 B # 221, or Kovac figure 4 # 12) in which a bonding channel overlapping with the bond opening is formed, (Tsai figure 2B-C, # 211 etc. or Kovac col. 4 lines 4-6, not illustrated in figures) and a chip fixed to the interconnect layer to cover the bonding channel (Tsai figure 2 B 220)

Tsai and Kovac does not specifically mention the presently newly added limitation namely " at least one wire connected to the chip and extending through the bond opening and the bonding channel."

However Lynch , a patent from the same filed of endeavor describes in 2 B to 4 A and col. 10 lines 8 to 29 describes leads 312, 314 and 316 with portions thereof extending through slit 326 and connected to chip through TAB bonding , to form well supported leads and selected external portions of selected lead traces can be connected to external ground or power and the beneficial electrical characteristics discussed above accrue to a flexible, tape mounted semiconductor assembly.

Therefor it would have been obvious to one of ordinary skill in the art at the time of the invention to include Lynch's at least one wire connected to the chip and extending through the bond opening and the bonding channel in Kovac's device. The motivation to combine Kovac and Lynch as stated above include to form well supported leads (Lynch col.2 lines 10-15) and selected external portions of selected lead traces can be

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connected to external ground or power and the beneficial electrical characteristics discussed above accrue to a flexible, tape mounted semiconductor assembly. (Lynch col. 5 lines 11-31).

The remaining limitations of claim 1 are :

an encapsulation material arranged in the bonding channel (Tsai col. 5 lines 5-7) an escape prevention structure for the bonding channel, (Kovac figure 4 # 26,30) to enable escaping of air from the bonding channel and to substantially prevent the encapsulation material from escaping from the bonding channel on introducing encapsulation material into the bonding channel after the applying of a chip to the supporting structure.

The recitation, " to enable escaping of air from bonding channel and to substantially prevent the encapsulation material from escaping from the bonding channel on introducing encapsulation material into the bonding channel after the applying of a chip to the supporting structure." are taken to be functionally inherent properties.

It is elementary that the mere recitation of a newly discovered function or property, inherently possessed by things in the prior art , does not cause a claim drawn to 'distinguish over the prior art. Additionally, where the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing, novelty in the claimed subject matter , may in fact be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown

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to be in the prior art does not possess the characteristic relied on. In re Swinehart 169 USPQ 226 (CCPA 1970).

(It is noted that Tsai col.3 lines 5-10 , col. 5 lines 10-13 Kovac figure 4, etc. and abstract lines 2-12 describe the functionally inherent property to enable escaping of air from bonding channel and to prevent the encapsulation material from escaping from the bonding channel on introducing encapsulation material into the bonding channel after the applying of a chip to the supporting structure).

With respect to claim 2 Tsai or Kovac describes the package of claim 1 wherein the escape prevention structure is designed to prevent escaping of the encapsulation material due to the capillary effect. (Kovac col. 4 lines 50-54) .

With respect to claims 3 and 4 Tsai or Kovac describes the package of claim 1 , wherein the escape prevention structure includes an opening with such a cross-sectional area, so that escaping of the encapsulation material caused by the capillary effect is prevented. (Kovac's Abstract last 6 lines, col.4 lines 50-54 and figures 1-5 ,etc.).

With respect to claim 5 Tsai or Kovac describes the package (supporting structure) of claim 4, wherein the barrier structure is connected to the interconnect layer. (Kovac col. 4 lines 17- 18).

With respect to claim 6 Tsai or Kovac describes the package (supporting structure) of claim 4, wherein the barrier structure is formed integrally with the interconnect layer. (Kovac figures 30 and 32 formed integrally).

With respect to claim 7 Tsai or Kovac describes the (package) supporting structure of claim 4, wherein the barrier structure extends across the entire width of the bonding channel. (Kovac e.g. figure 4 30 extends across wider portion above 20).

With respect to claim 8 Tsai or Kovac describes the (package) supporting structure of claim 4, wherein the barrier structure is formed, so that a cross-section of the bonding channel tapers in a direction to the lateral end. (Tsai figure 1B) .

With respect to claim 9 Tsai or Kovac describes the (package) supporting structure of claim 4, wherein the barrier structure has a convex shape. (Tsai fig. IB #140).

With respect to claim 10 Tsai or Kovac describes the (package) supporting structure of barrier's structure is disposed in the bonding channel and spaced from the interconnect layer. (Kovac e.g. figure 4, 30 disposed in 14, 20 spaced from 32).

With respect to claim 11 Tsai or Kovac describes the (package) supporting structure of between the chip and the supporting substrate, (Tsai figs. 2 D, F and Kovac fig. 4 #.26, 30) the escape prevention structure configured to substantially prevent an encapsulation material flow out of the bonding channel, and further configured to enable escaping of air from the bonding channel.

The recitation, " to enable escaping of air from bonding channel and to substantially prevent the encapsulation material from escaping from the bonding channel on introducing encapsulation material into the bonding channel after the applying of a chip to the supporting structure." are taken to be functionally inherent properties.

It is elementary that the mere recitation of a newly discovered function or property, inherently possessed by things in the prior art , does not cause a claim drawn to distinguish over the prior art. Additionally, where in the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing, novelty in the claimed subject matter , may in fact be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on. In re Swinehart 169 USPQ 226 (CCPA 1970).

(It is noted that Tsai col.3 lines 5-10 , col. 5 lines 10-13 Kovac figure 4, etc. and abstract lines 2-12 describe the functionally inherent property to enable escaping of air from bonding channel and to prevent the encapsulation material from escaping from the bonding channel on introducing encapsulation material into the bonding channel after the applying of a chip to the supporting structure).

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With respect to claim 24 Tsai or Kovac describes the arrangement of claim 23, wherein the bonding channel has an opening at a lateral end, and wherein the escape prevention structure defines the cross section of the opening of the bonding channel. (Tsai, Kovac figures)

With respect to Claim 25 Tsai or Kovac describes the arrangement of claim 24, wherein the escape prevention structure includes a portion connected to the interconnect layer. (Kovac col.4 lines 17-18).

With respect to claim 26 Tsai or Kovac describes the arrangement of claim 24, wherein the escape prevention structure includes a portion formed integrally with the interconnect layer Kovac col. 4 lines 17-18).

With respect to claim 27 Tsai or Kovac describes the arrangement of claim 24, wherein the escape prevention structure includes a portion that extends across the entire width of the bonding channel. (Kovac e.g. figure 4 , 30 extends across wider portion above 20)

With respect to claim 28 Tsai or Kovac describes the arrangement of claim 24, wherein the escape prevention structure is formed such that a cross-section of the bonding channel tapers in a direction to the lateral end. (Tsai figure 1 B).

With respect to claim 29 Tsai or Kovac describes the arrangement of claim 24, wherein the escape prevention structure has a convex shape at Tsai figure 1 B # 140).

With respect to Claim 30 Tsai or Kovac describes the arrangement of claim 24, wherein the escape prevention structure is disposed in the bonding channel and spaced from the interconnect layer.(rejected for reasons set out under claim 10 above)

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With respect to claim 31 Tsai or Kovac describes the arrangement of claim 24, wherein the escape prevention structure includes a recess in the supporting substrate. (rejected for reasons set out under claim 11 above).

Response to Arguments

Applicant's arguments filed on 08/08/2005 have been fully considered but they are not persuasive for the following reasons :

All of applicants' arguments are moot in view of the above rejection and it is noted that Applicants' arguments regarding claim 23 are not consumarate in scope with the presently recited limitations.

The motivation to combine the references as applied ahs been provided in the rejection itself.

Therefore all pending claims 1-11,13,14 and 23-31 are finally rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


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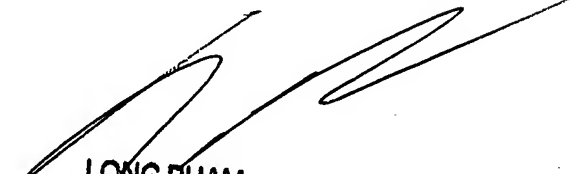
the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (571)272-1718. The examiner can normally be reached on 8.00 to 5.00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fahmy Wael can be reached on (571) 272-1714. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


3/22/06


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